

# Design Guidance For the Use of Corzan CPVC in Hydronic Heating and Cooling Systems

## Hydronic Additives and Other Fluids

### 1: Antifreeze / Heat Transfer Fluids

Corzan® Piping Systems may be used to handle propylene glycol solutions up to 35%, methanol solutions up to 10%, and ethylene glycol or glycerin\* solutions at any concentration. Check the compatibility of other types of antifreezes or heat transfer fluids with the manufacturer prior to use.

### 2: Corrosion Inhibitors, Biocides, other water treatment chemicals

Corzan® CPVC has been used for decades in industrial process water applications handling chilled and boiler water treated with corrosion inhibitors, biocides, and other types of treatment chemicals similar to those used for recirculating HVAC systems. No detrimental effects from such chemicals have ever been observed when these chemicals are applied at their recommended dosage rates. Corzan CPVC is not recommended for use as piping to dispense such chemicals in concentrated form into recirculating systems.

### 3: Refrigerants / Compressor Lubricants

While refrigerant and/or compressor lubricant should not normally enter the recirculating fluid in a properly operating system, they may be released into the recirculating fluid and/or condensate drain in the event of a rupture of the heat exchanger. Polyol ester (POE) lubricants are incompatible with CPVC and will likely cause cracking of the fittings and/or pipe if they are released into the recirculating fluid or condensate drain. Lubrizol is not aware of any failures of HVAC piping systems that have been caused by other types of compressor lubricants including mineral oils, polyvinyl ethers (PVE), polyalkylene glycols (PAG) or poly-alpha-olefins (PAO).

In the event of a heat exchanger failure (and particularly with POE lubricants), it is recommended to drain and flush the CPVC piping and to replace the contaminated fluid with clean fluid while the system is being repaired in order to minimize further piping damage. Be aware that damage to the piping may already have occurred and that flushing may not completely remove all the oil from crevices in the system. Therefore, while draining and flushing is recommended to minimize damage, it is not guaranteed to prevent leaks from occurring in the Corzan piping system. Should the Corzan piping require repairs, the use of an approved mechanical joining systems will minimize downtime.

### 4: Residual oils\*

Some heat exchangers or condenser coils may contain residual oils from the manufacturing process which can cause cracking of CPVC. Caution should be exercised when installing CPVC in combination hot water/air heating units or as condensate drain lines for air conditioning systems. Confirm the compatibility of CPVC with the residual oils prior to installation. The interior of heat exchangers or the exterior of condenser coils may be thoroughly flushed with mild ionic detergent solution (2% TSP in water, for example) to remove incompatible oils prior to piping installation. A rinse with clean water to completely clean the system is advisable as a final flushing.

\*<https://www.lubrizol.com/CPVC/FBC-System-Compatible-Program/Other-Compatibility-Topics>



## Design DOs and DON'Ts for Hydronic Applications

### DOs

- Maximum operating temperature 180°F
- Verify antifreeze compatibility & percentage
- Compensate for the expansion of the water and antifreeze in the design of the system
- Verify compatibility on all boiler cleaning or additives
- Follow all CPVC installation guidelines
- Use only CPVC x metal threaded adapters
- Make sure pumps, and other components are properly supported
- Verify compatibility of all ancillary products used in the installation of the system
- Flush the Interior of the heat exchanger or the exterior of condenser coils with a mild ionic detergent, such as a 2% solution of TSP (Trisodium Phosphate).

### DON'Ts

- DO NOT use 100% CPVC threaded adapters
- DO NOT use Compression Fittings
- DO NOT use CPVC pipes or fittings to support pumps or other components

